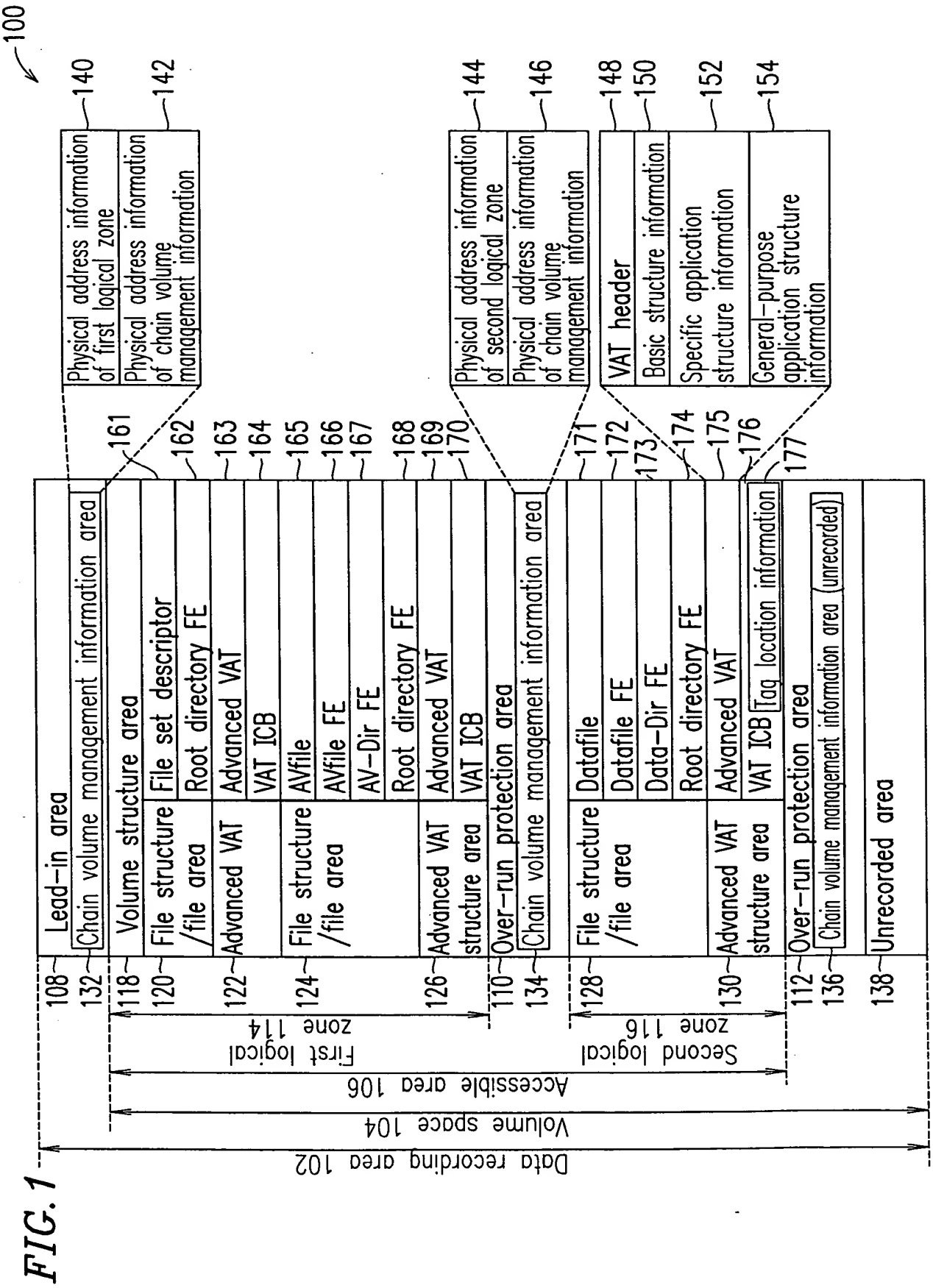

100
Physical address information of first logical zone
Physical address information of chain volume management information
Physical address information of second logical zone
Physical address information of chain volume management information
VAT header
Basic structure information
Specific application structure information
General-purpose application structure information
140
142
144
146
148
150
152
154
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
Lead-in area
Chain volume management information area
Volume structure area
File structure /file area
File set descriptor
Root directory FE
Advanced VAT
VAT ICB
AVfile
AVfile FE
AV-Dir FE
Root directory FE
Advanced VAT
VAT ICB
Over-run protection area
Chain volume management information area
File structure /file area
Datafile
Datafile FE
Data-Dir FE
Root directory FE
Advanced VAT
VAT ICB
Tag location information
Over-run protection area
Chain volume management information area (unrecorded)
Unrecorded area
108
132
118
120
122
124
126
110
134
128
130
112
136
138
First logical zone 114
Second logical zone 116
Accessible area 106
Volume space 104
Data recording area 102

FIG. 1

FIG. 2

(a)

163

Field name	Content
VAT header	Logical volume identifier etc.
Basic structure information	VAT entry 0 (Logical address of file set descriptor)
	VAT entry 1 (Logical address of root directory FE)
Specific application structure information	VAT entry 2 (unused: FFFFFFFFh) ⌇ VAT entry 255 (unused: FFFFFFFFh)
General-purpose application structure information	VAT entry 256 (unused: FFFFFFFFh) ⌇ VAT entry 473 (unused: FFFFFFFFh)

(b)

169

Field name	Content
VAT header	Logical volume identifier etc.
Basic structure information	VAT entry 0 (Logical address of file set descriptor)
	VAT entry 1 (Logical address of root directory FE)
Specific application structure information	VAT entry 2 (Logical address of directory (AV-Dir) FE)
	VAT entry 3 (Logical address of AVfile FE)
	VAT entry 4 (unused: FFFFFFFFh) ⌇ VAT entry 255 (unused: FFFFFFFFh)
General-purpose application structure information	VAT entry 256 (unused: FFFFFFFFh) ⌇ VAT entry 473 (unused: FFFFFFFFh)

(c)

175

Field name	Content
VAT header	Logical volume identifier etc.
Basic structure information	VAT entry 0 (Logical address of file set descriptor)
	VAT entry 1 (Logical address of root directory FE)
Specific application structure information	VAT entry 2 (Logical address of directory (AV-Dir) FE)
	VAT entry 3 (Logical address of AVfile FE)
	VAT entry 4 (unused: FFFFFFFFh) ⌇ VAT entry 255 (unused: FFFFFFFFh)
General-purpose application structure information	VAT entry 256 (Logical address of directory (Data-Dir) FE)
	VAT entry 257 (Logical address of Datafile FE)
	VAT entry 258 (unused: FFFFFFFFh) ⌇ VAT entry 473 (unused: FFFFFFFFh)

FIG. 3

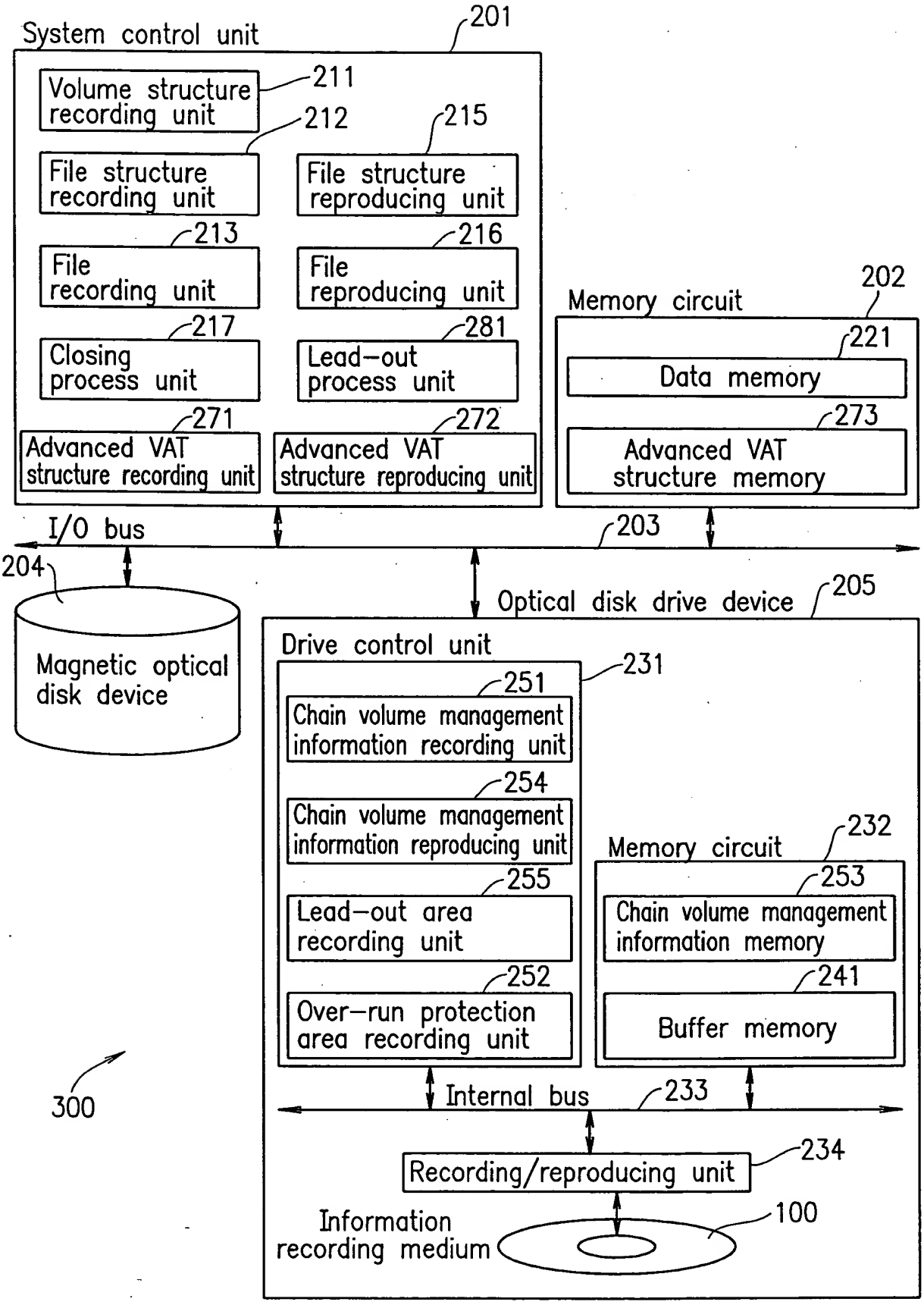
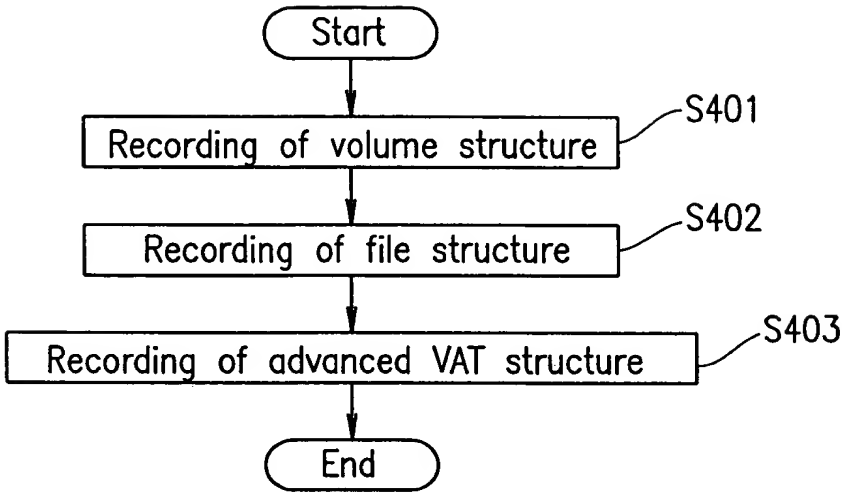

System control unit
201
Volume structure recording unit
211
File structure recording unit
212
File structure reproducing unit
215
File recording unit
213
File reproducing unit
216
Closing process unit
217
Lead-out process unit
281
Advanced VAT structure recording unit
271
Advanced VAT structure reproducing unit
272
Memory circuit
202
Data memory
221
Advanced VAT structure memory
273
I/O bus
203
204
Magnetic optical disk device
Optical disk drive device
205
Drive control unit
231
Chain volume management information recording unit
251
Chain volume management information reproducing unit
254
Lead-out area recording unit
255
Over-run protection area recording unit
252
Memory circuit
232
Chain volume management information memory
253
Buffer memory
241
Internal bus
233
Recording/reproducing unit
234
Information recording medium
100
300

FIG. 4



4,003,250 : 05/21/91 : 5,018,148

FIG. 5

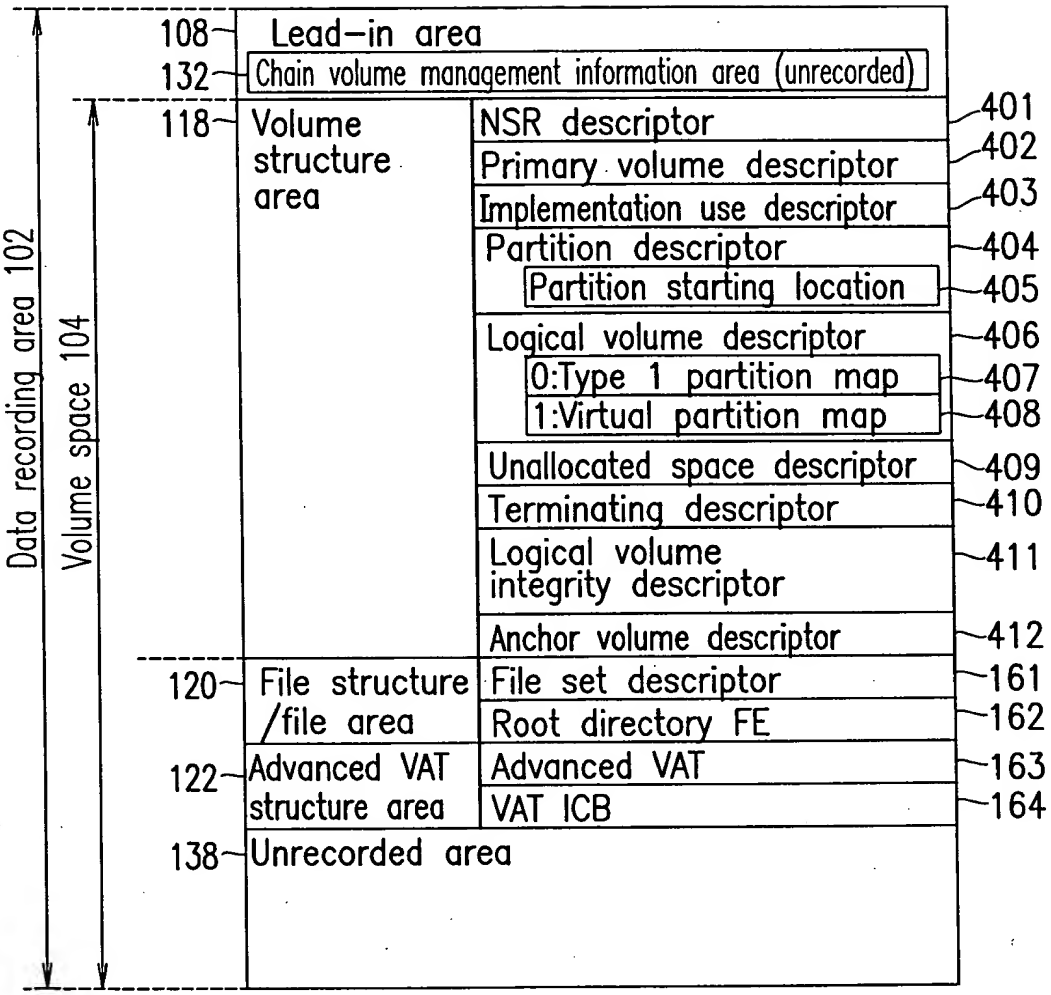

Data recording area 102
Volume space 104
108
Lead-in area
132
Chain volume management information area (unrecorded)
118
Volume structure area
NSR descriptor
401
Primary volume descriptor
402
Implementation use descriptor
403
Partition descriptor
404
Partition starting location
405
Logical volume descriptor
406
0:Type 1 partition map
407
1:Virtual partition map
408
Unallocated space descriptor
409
Terminating descriptor
410
Logical volume integrity descriptor
411
Anchor volume descriptor
412
120
File structure /file area
File set descriptor
161
Root directory FE
162
122
Advanced VAT structure area
Advanced VAT
163
VAT ICB
164
138
Unrecorded area

FIG. 6

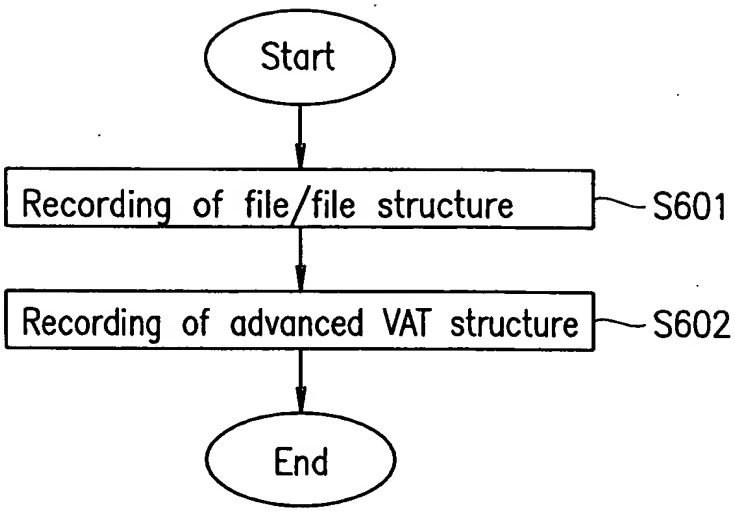
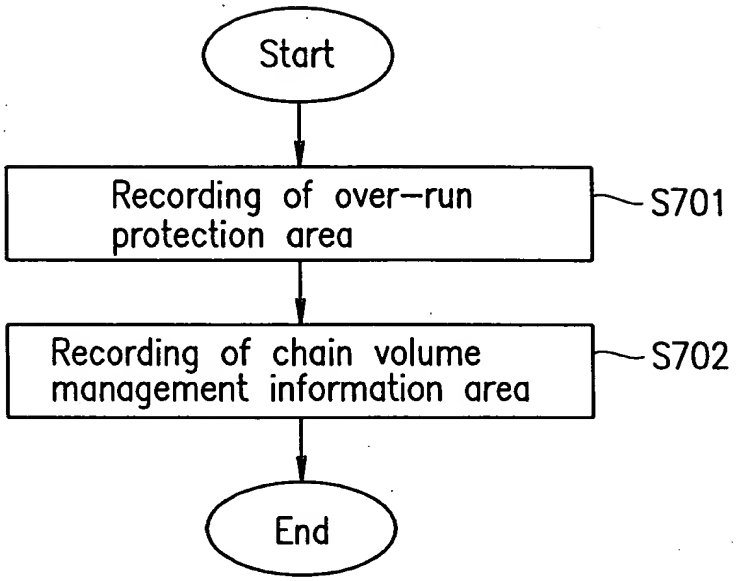

Start
Recording of file/file structure
S601
Recording of advanced VAT structure
S602
End

FIG. 7


Start
Recording of over-run protection area
S701
Recording of chain volume management information area
S702
End

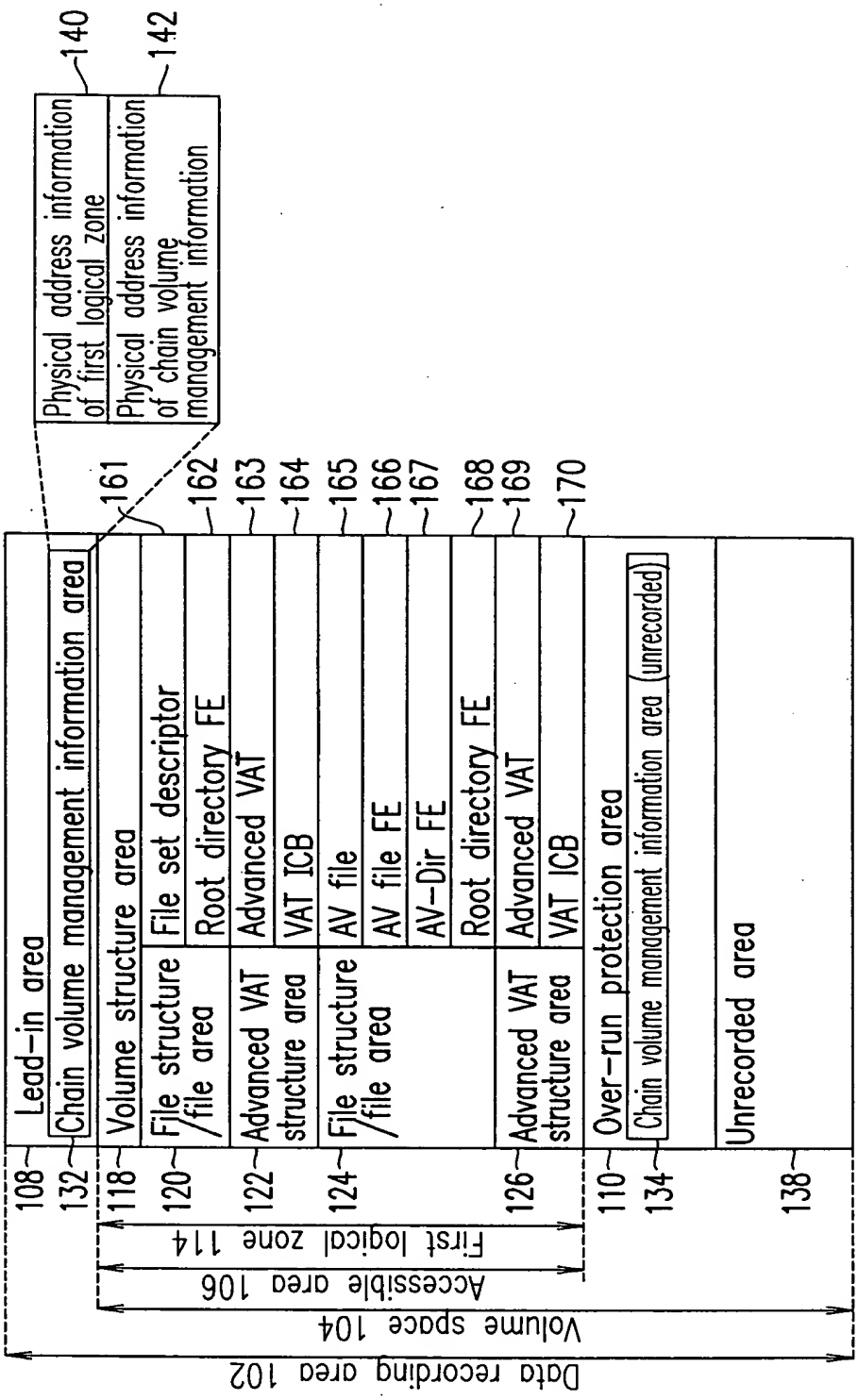

Physical address information of first logical zone
Physical address information of chain volume management information
140
142
161
162
163
164
165
166
167
168
169
170
Lead-in area
Chain volume management information area
Volume structure area
File structure /file area
File set descriptor
Root directory FE
Advanced VAT structure area
Advanced VAT
VAT ICB
File structure /file area
AV file
AV file FE
AV-Dir FE
Root directory FE
Advanced VAT structure area
Advanced VAT
VAT ICB
Over-run protection area
Chain volume management information area (unrecorded)
Unrecorded area
108
132
118
120
122
124
126
110
134
138
First logical zone 114
Accessible area 106
Volume space 104
Data recording area 102

FIG. 8

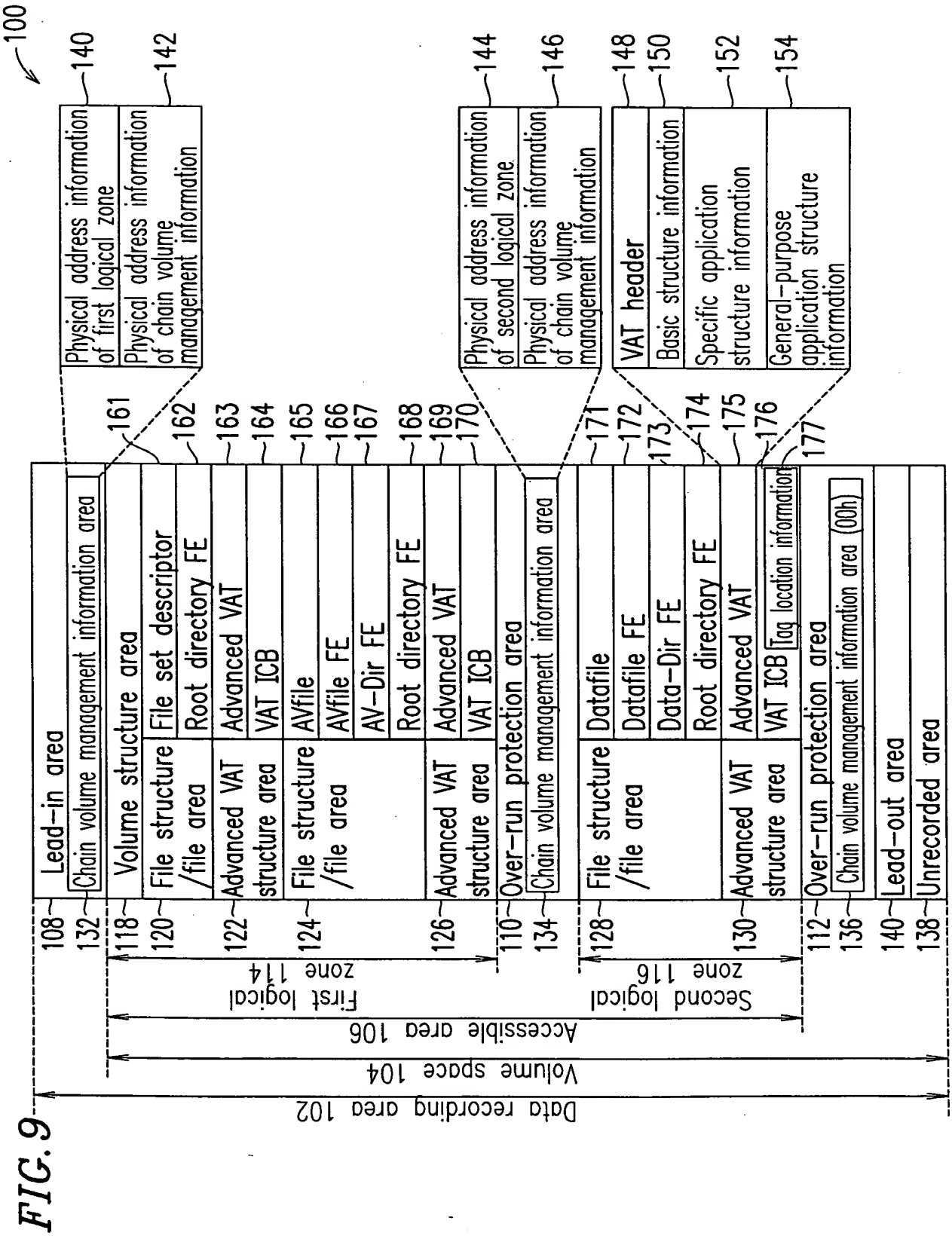
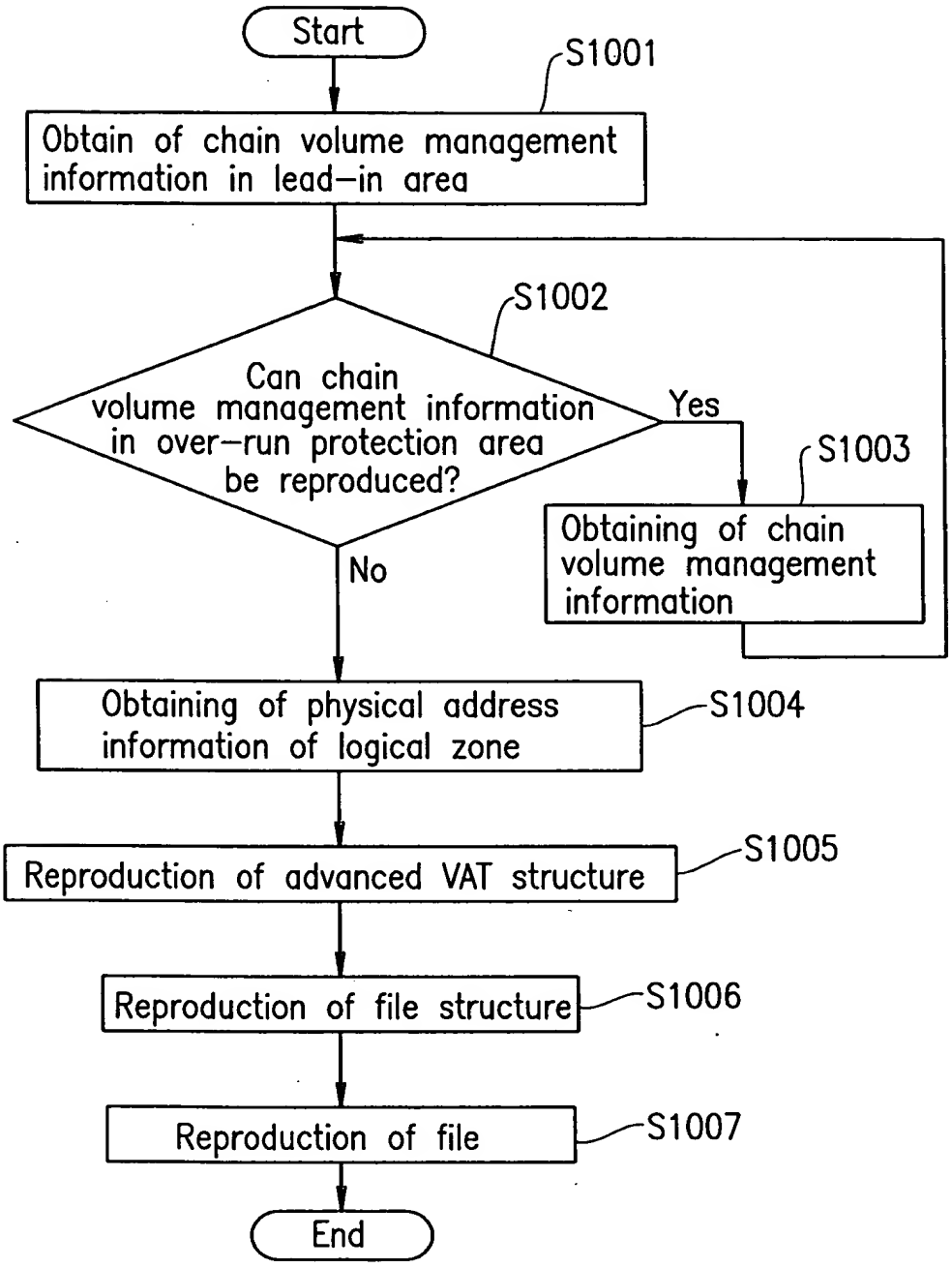

100
Physical address information of first logical zone
Physical address information of chain volume management information
Physical address information of second logical zone
Physical address information of chain volume management information
VAT header
Basic structure information
Specific application structure information
General-purpose application structure information
140
142
144
146
148
150
152
154
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
Lead-in area
Chain volume management information area
Volume structure area
File structure /file area
File set descriptor
Root directory FE
Advanced VAT structure area
Advanced VAT
VAT ICB
File structure /file area
AVfile
AVfile FE
AV-Dir FE
Root directory FE
Advanced VAT structure area
Advanced VAT
VAT ICB
Over-run protection area
Chain volume management information area
File structure /file area
Datafile
Datafile FE
Data-Dir FE
Root directory FE
Advanced VAT structure area
Advanced VAT
VAT ICB
Tag location information
Over-run protection area
Chain volume management information area (00h)
Lead-out area
Unrecorded area
108
132
118
120
122
124
126
110
134
128
130
112
136
140
138
First logical zone 114
Second logical zone 116
Accessible area 106
Volume space 104
Data recording area 102

FIG. 9

FIG. 10


Start
S1001
Obtain of chain volume management information in lead-in area
S1002
Can chain volume management information in over-run protection area be reproduced?
Yes
S1003
Obtaining of chain volume management information
No
Obtaining of physical address information of logical zone
S1004
Reproduction of advanced VAT structure
S1005
Reproduction of file structure
S1006
Reproduction of file
S1007
End

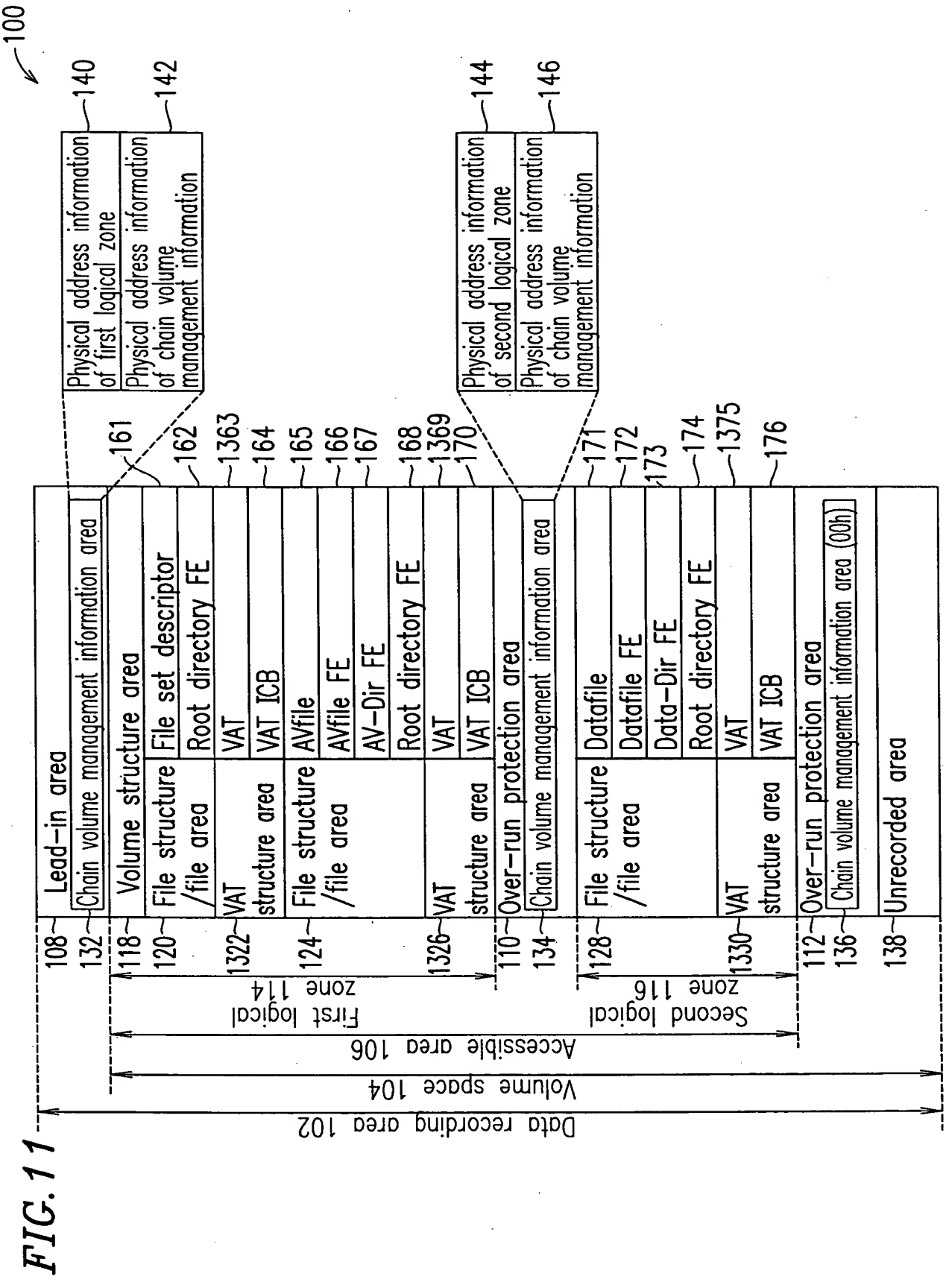

100
Physical address information of first logical zone
Physical address information of chain volume management information
Physical address information of second logical zone
Physical address information of chain volume management information
140
142
144
146
161
162
1363
164
165
166
167
168
1369
170
171
172
173
174
1375
176
Lead-in area
Chain volume management information area
Volume structure area
File set descriptor
Root directory FE
VAT
VAT ICB
AVfile
AVfile FE
AV-Dir FE
Root directory FE
VAT
VAT ICB
Over-run protection area
Chain volume management information area
Datafile
Datafile FE
Data-Dir FE
Root directory FE
VAT
VAT ICB
Over-run protection area
Chain volume management information area (00h)
Unrecorded area
File structure /file area
VAT structure area
File structure /file area
VAT structure area
File structure /file area
VAT structure area
108
132
118
120
1322
124
1326
110
134
128
1330
112
136
138
First logical zone 114
Second logical zone 116
Accessible area 106
Volume space 104
Data recording area 102

FIG. 11

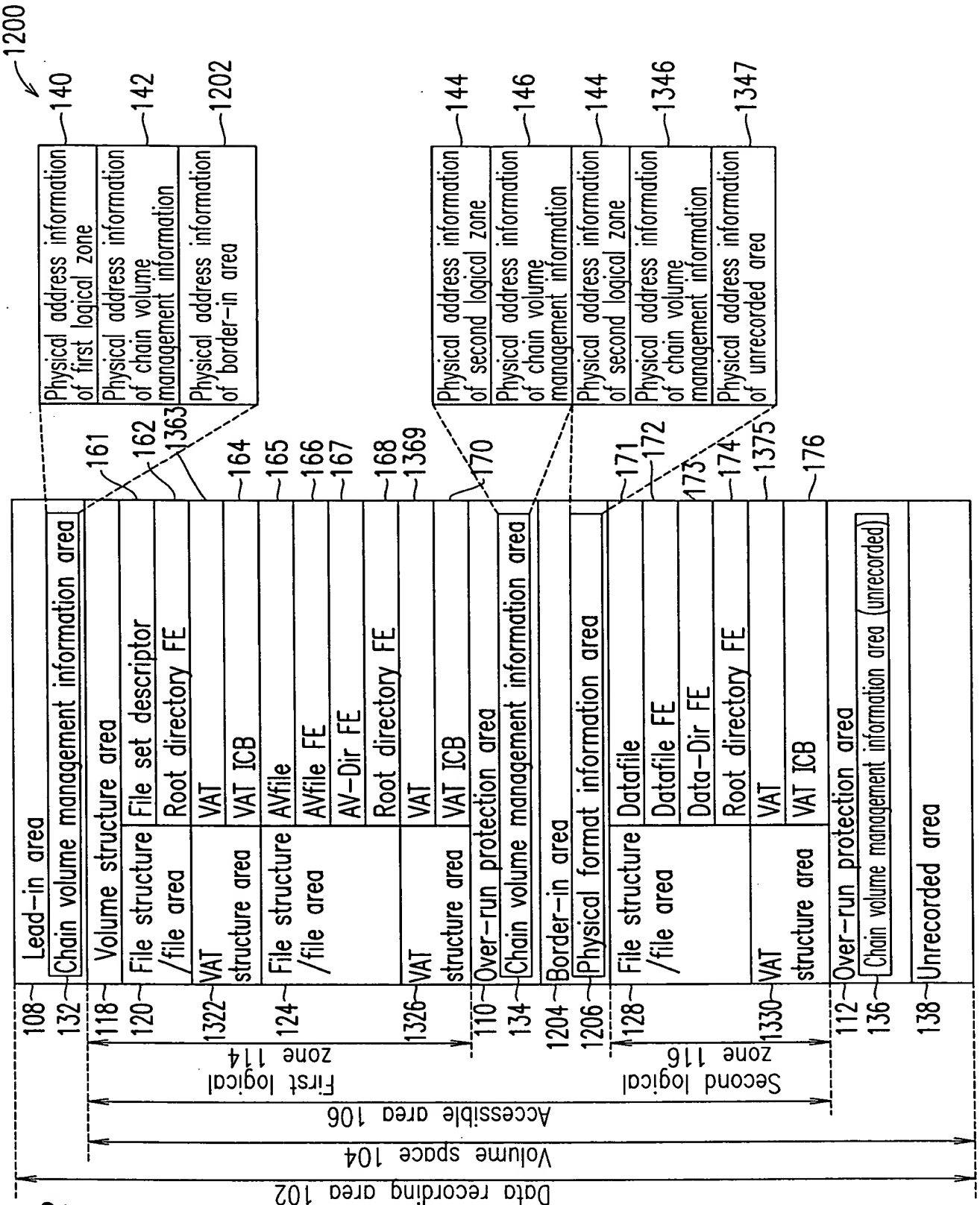

1200
Physical address information of first logical zone
140
Physical address information of chain volume management information
142
Physical address information of border-in area
1202
Physical address information of second logical zone
144
Physical address information of chain volume management information
146
Physical address information of second logical zone
144
Physical address information of chain volume management information
1346
Physical address information of unrecorded area
1347
Lead-in area
Chain volume management information area
Volume structure area
File structure /file area
File set descriptor
Root directory FE
VAT
VAT structure area
VAT ICB
File structure /file area
AVfile
AVfile FE
AV-Dir FE
Root directory FE
VAT
VAT structure area
VAT ICB
Over-run protection area
Chain volume management information area
Border-in area
Physical format information area
File structure /file area
Datafile
Datafile FE
Data-Dir FE
Root directory FE
VAT
VAT structure area
VAT ICB
Over-run protection area
Chain volume management information area (unrecorded)
Unrecorded area
108
132
118
120
1322
124
1326
110
134
1204
1206
128
1330
112
136
138
161
162
1363
164
165
166
167
168
1369
170
171
172
173
174
1375
176
First logical zone 114
Second logical zone 116
Accessible area 106
Volume space 104
Data recording area 102

FIG. 12

FIG. 13

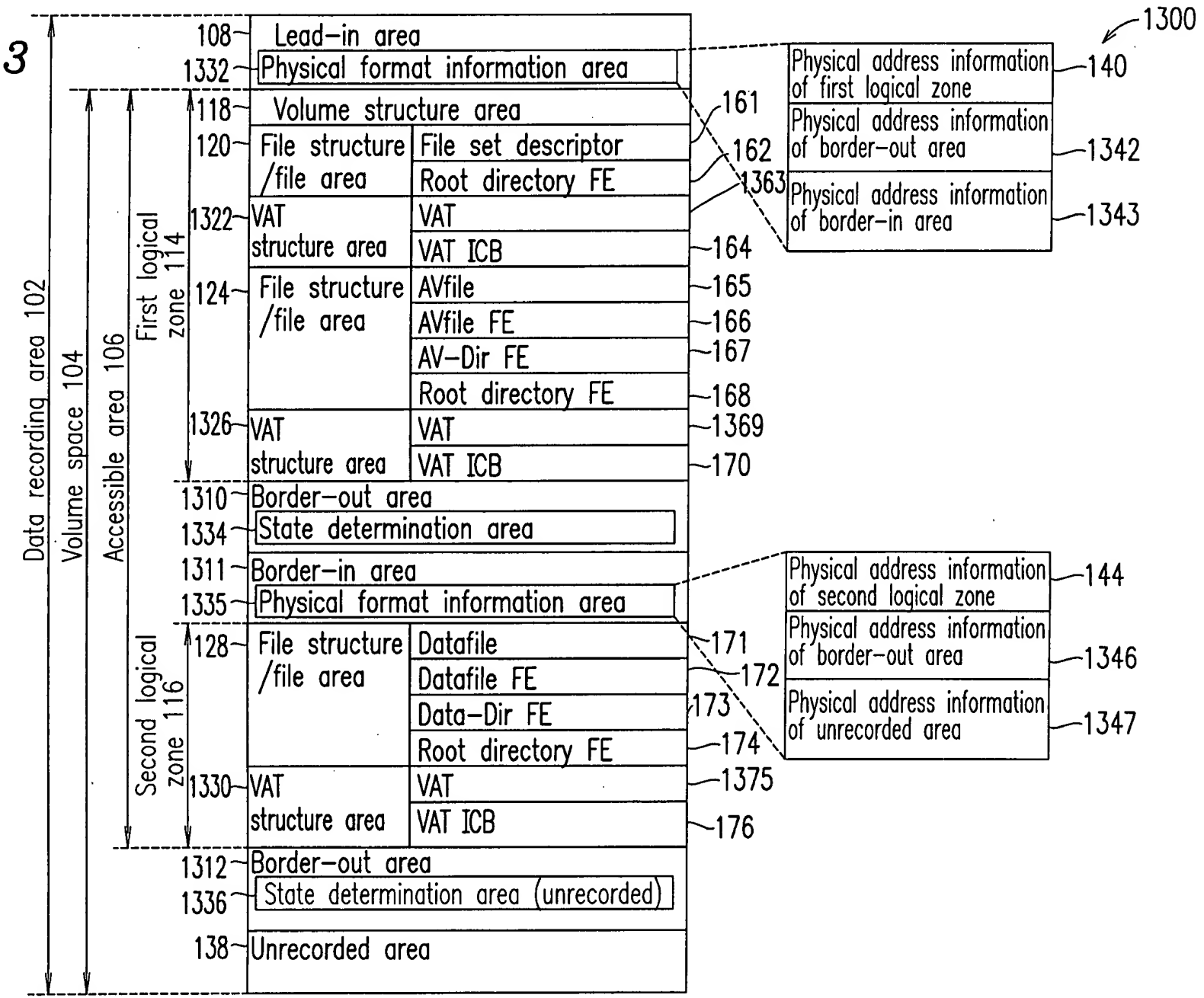

1300
Data recording area 102
Volume space 104
Accessible area 106
First logical zone 114
Second logical zone 116
108 Lead-in area
1332 Physical format information area
118 Volume structure area
120 File structure /file area
File set descriptor
Root directory FE
1322 VAT structure area
VAT
VAT ICB
124 File structure /file area
AVfile
AVfile FE
AV-Dir FE
Root directory FE
1326 VAT structure area
VAT
VAT ICB
1310 Border-out area
1334 State determination area
1311 Border-in area
1335 Physical format information area
128 File structure /file area
Datafile
Datafile FE
Data-Dir FE
Root directory FE
1330 VAT structure area
VAT
VAT ICB
1312 Border-out area
1336 State determination area (unrecorded)
138 Unrecorded area
161
162
1363
164
165
166
167
168
1369
170
171
172
173
174
1375
176
Physical address information of first logical zone 140
Physical address information of border-out area 1342
Physical address information of border-in area 1343
Physical address information of second logical zone 144
Physical address information of border-out area 1346
Physical address information of unrecorded area 1347

FIG. 14

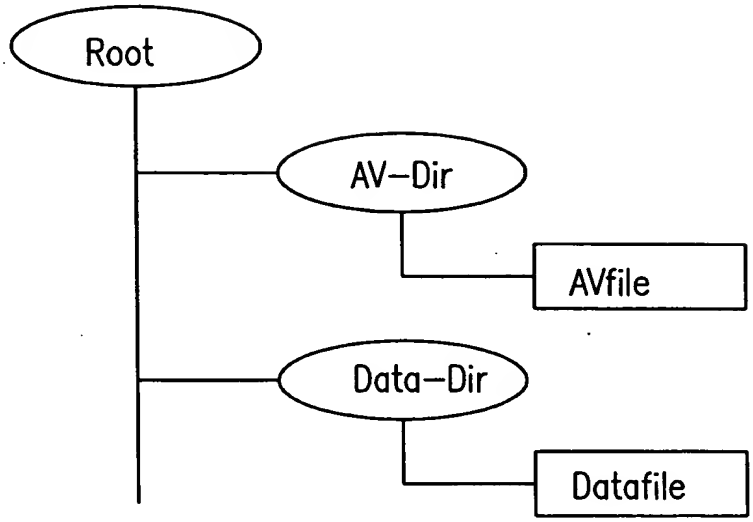


FIG. 15

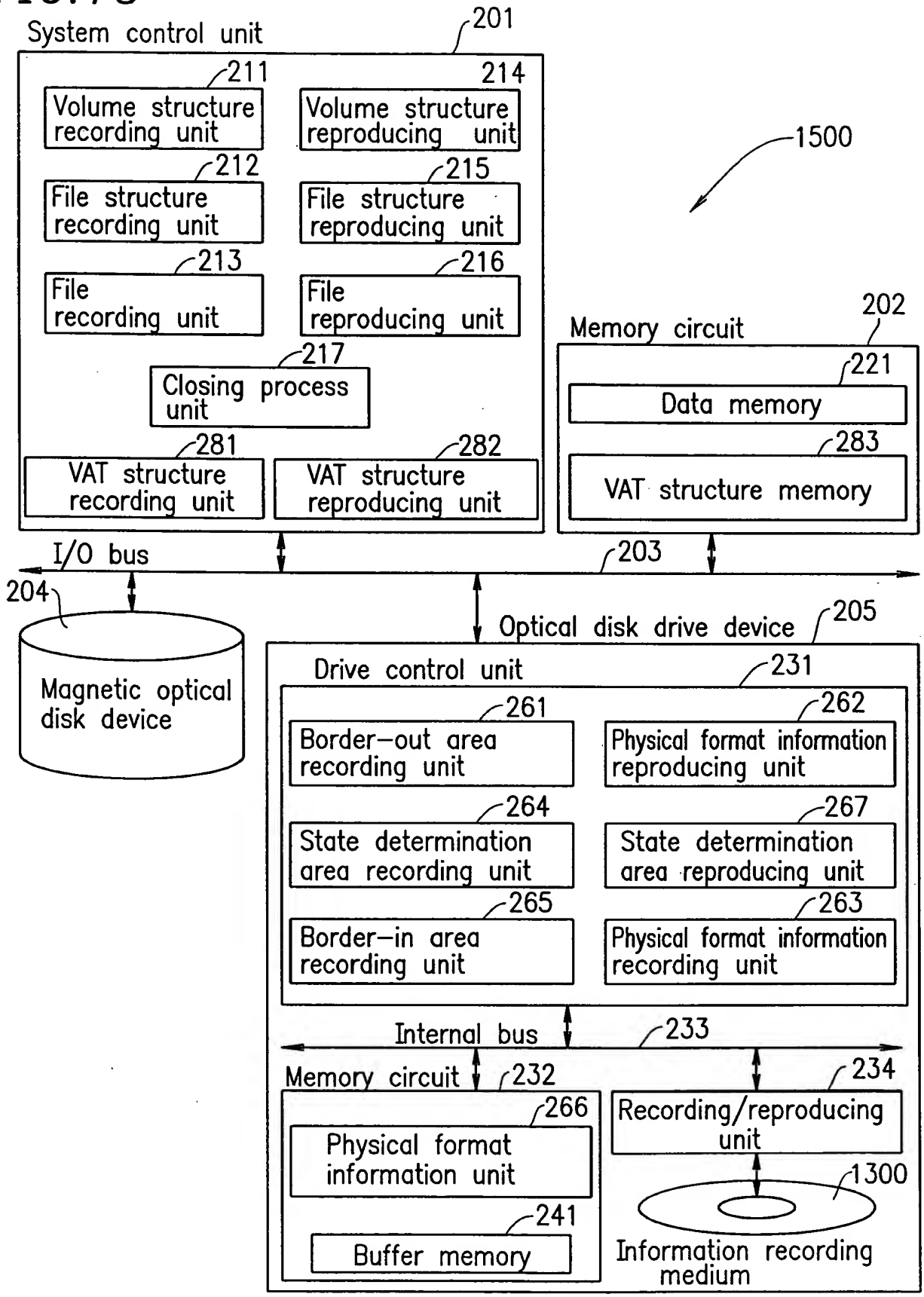

System control unit
201
211
Volume structure recording unit
214
Volume structure reproducing unit
1500
212
File structure recording unit
215
File structure reproducing unit
213
File recording unit
216
File reproducing unit
217
Closing process unit
281
VAT structure recording unit
282
VAT structure reproducing unit
Memory circuit
202
221
Data memory
283
VAT structure memory
I/O bus
203
204
Magnetic optical disk device
Optical disk drive device
205
Drive control unit
231
261
Border-out area recording unit
262
Physical format information reproducing unit
264
State determination area recording unit
267
State determination area reproducing unit
265
Border-in area recording unit
263
Physical format information recording unit
Internal bus
233
Memory circuit
232
234
266
Physical format information unit
Recording/reproducing unit
1300
241
Buffer memory
Information recording medium

FIG. 16

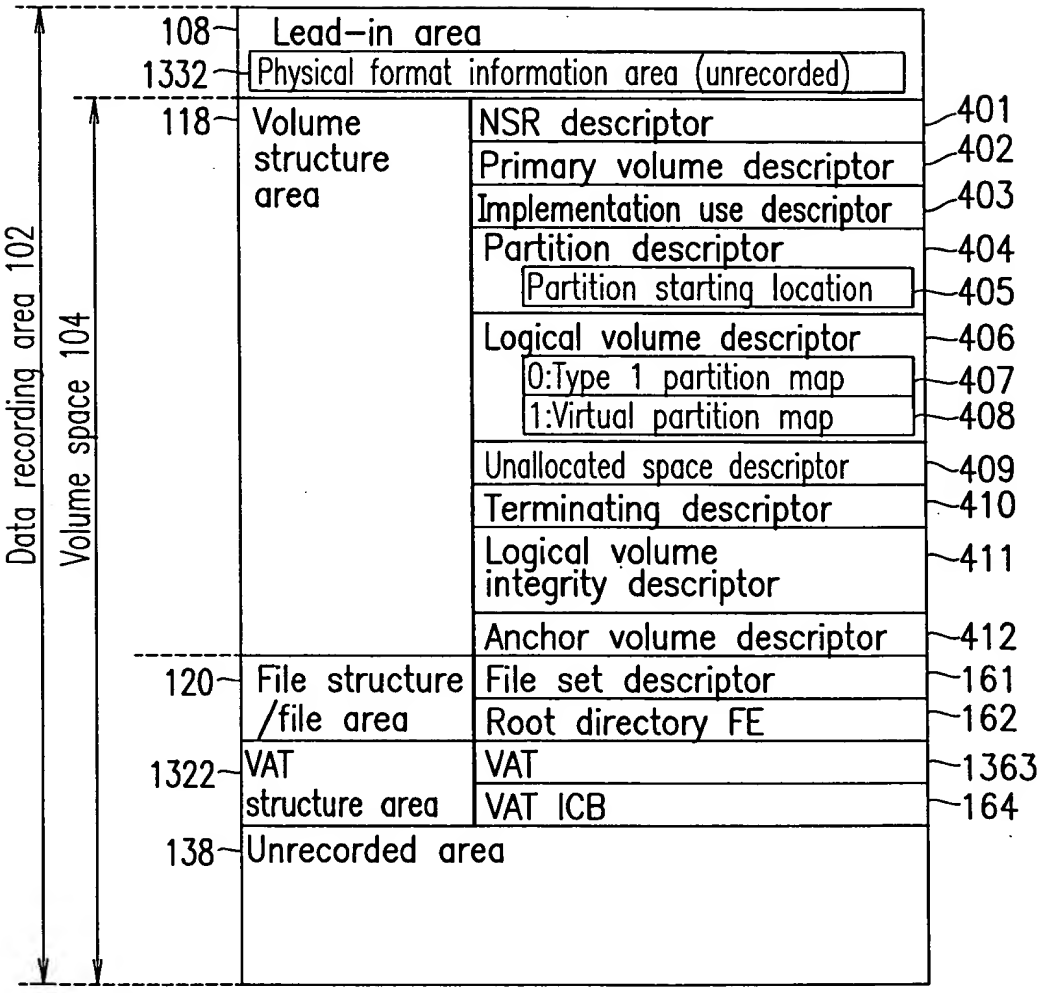

Data recording area 102
Volume space 104
108
Lead-in area
1332
Physical format information area (unrecorded)
118
Volume structure area
NSR descriptor
401
Primary volume descriptor
402
Implementation use descriptor
403
Partition descriptor
404
Partition starting location
405
Logical volume descriptor
406
0:Type 1 partition map
407
1:Virtual partition map
408
Unallocated space descriptor
409
Terminating descriptor
410
Logical volume integrity descriptor
411
Anchor volume descriptor
412
120
File structure /file area
File set descriptor
161
Root directory FE
162
1322
VAT structure area
VAT
1363
VAT ICB
164
138
Unrecorded area

FIG. 17

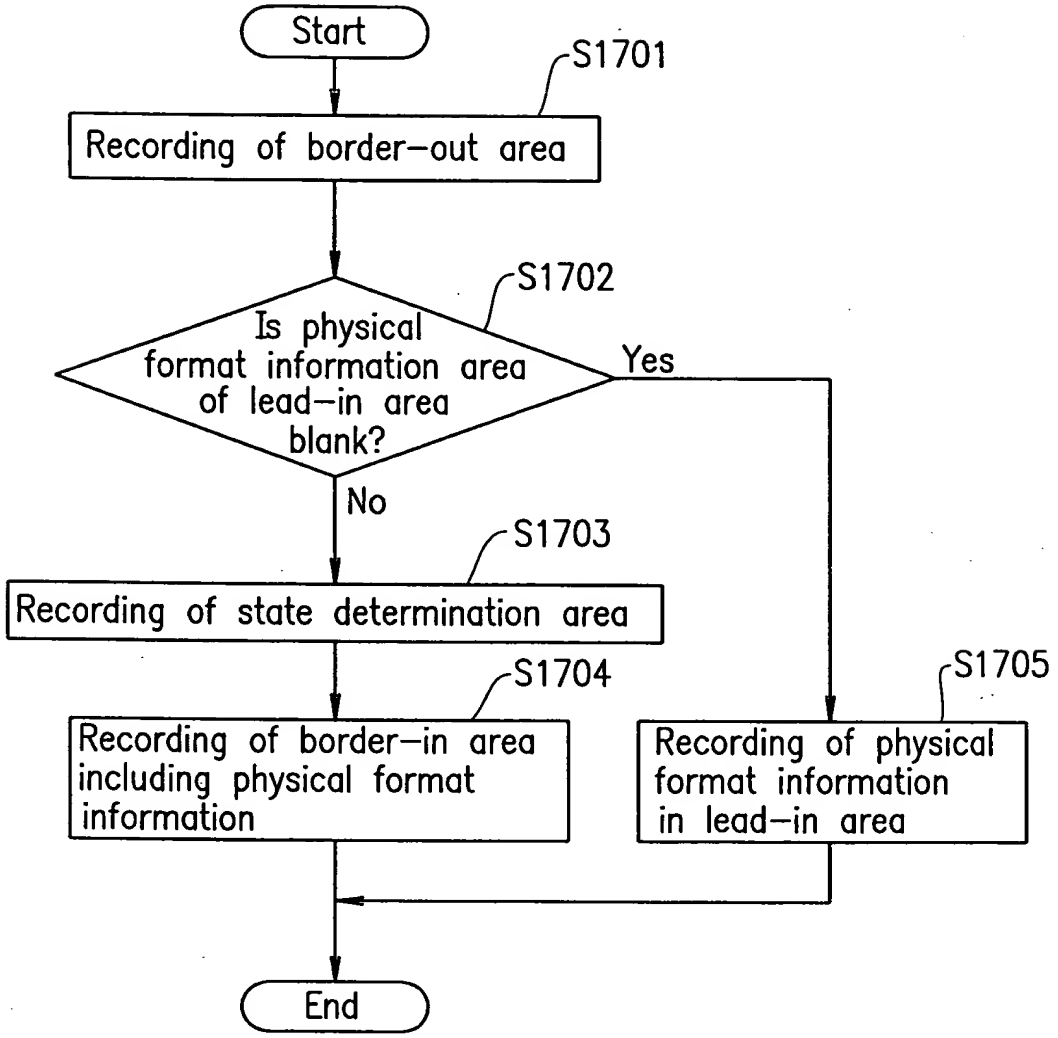

Start
S1701
Recording of border-out area
S1702
Is physical format information area of lead-in area blank?
Yes
No
S1703
Recording of state determination area
S1704
Recording of border-in area including physical format information
S1705
Recording of physical format information in lead-in area
End

FIG. 18

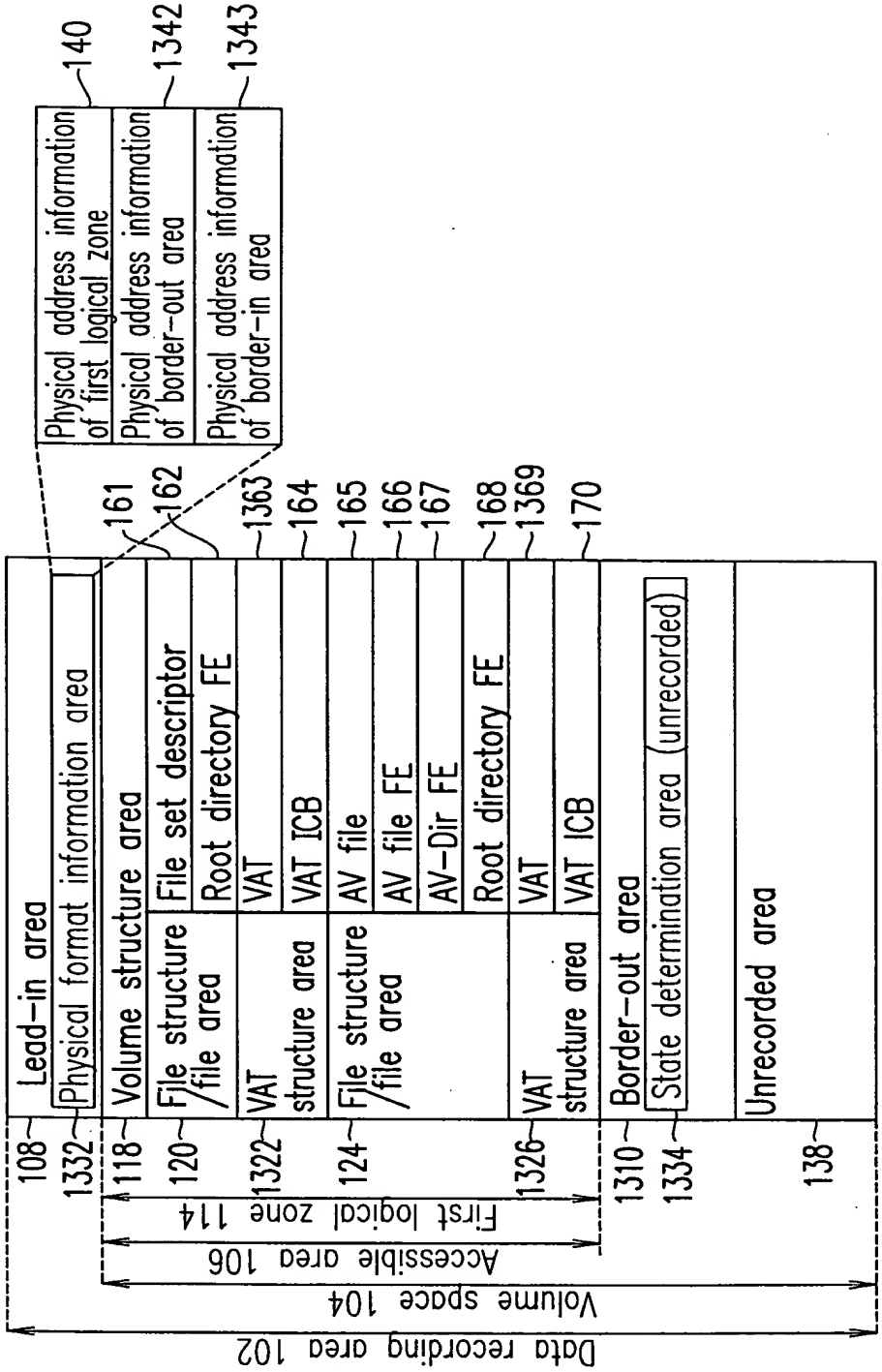
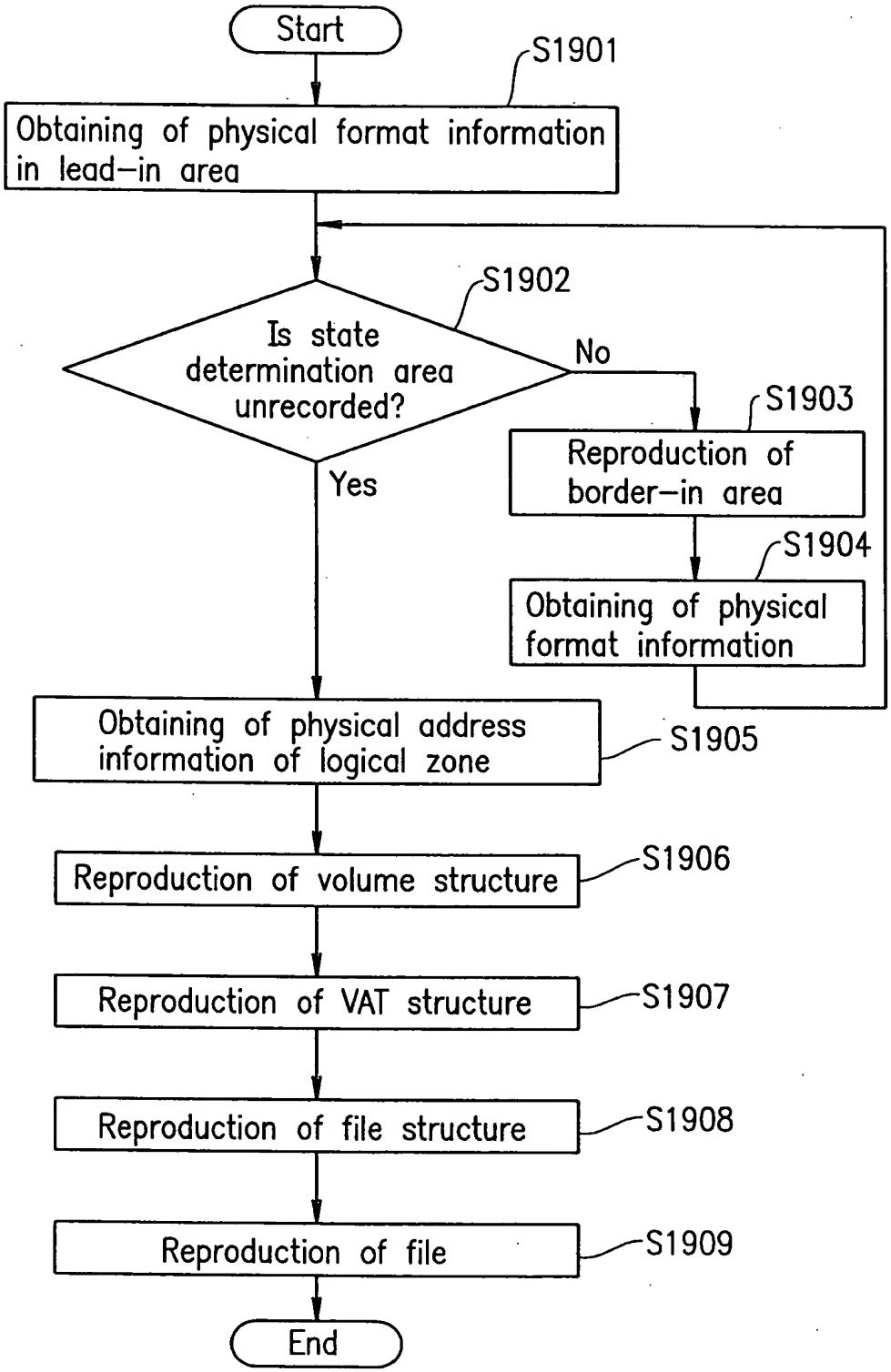

Physical address information of first logical zone
Physical address information of border-out area
Physical address information of border-in area
140
1342
1343
161
162
1363
164
165
166
167
168
1369
170
Lead-in area
Physical format information area
Volume structure area
File structure /file area
File set descriptor
Root directory FE
VAT
VAT structure area
VAT ICB
AV file
File structure /file area
AV file FE
AV-Dir FE
Root directory FE
VAT
VAT structure area
VAT ICB
Border-out area
State determination area (unrecorded)
Unrecorded area
108
1332
118
120
1322
124
1326
1310
1334
138
First logical zone 114
Accessible area 106
Volume space 104
Data recording area 102

FIG. 19


Start
S1901
Obtaining of physical format information in lead-in area
S1902
Is state determination area unrecorded?
No
Yes
S1903
Reproduction of border-in area
S1904
Obtaining of physical format information
Obtaining of physical address information of logical zone
S1905
Reproduction of volume structure
S1906
Reproduction of VAT structure
S1907
Reproduction of file structure
S1908
Reproduction of file
S1909
End